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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------------------------------------------------------------|-------------|----------------------|---------------------|------------------|
| 10/764,044 | 01/23/2004 | David Mark Blunt | 12,469 | 7971 |
| 7590 | 09/30/2004 | | EXAMINER | |
| Mr. William W. Haefliger Suite 512 201 S. Lake Ave. Pasadena, CA 91101 | | | MILLER, ROSE MARY | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2856 | |

DATE MAILED: 09/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|-----------|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/764,044 | BLUNT, DAVID MARK | |
| | Examiner | Art Unit | <i>Am</i> |
| | Rose M Miller | 2856 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 23 January 2004 & 14 June 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-13 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 1-5, 9 and 10 is/are allowed.
- 6) Claim(s) _____ is/are rejected.
- 7) Claim(s) 6-8 and 11-13 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 14 June 2004 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/23/04.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 23 January 2004 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.
2. The information disclosure statement filed 23 January 2004 fails to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office. It has been placed in the application file, but the information referred to therein has not been considered.
3. The above problems with the information disclosure statement filed 23 January 2004 arise from the listing on the statement to "See attached listing of References". As there was neither attached list nor any copies of References attached, the Examiner is unable to determine what Applicant wished to be considered. Please note, no IDS is complete until all requirements are met. Therefore, a resubmission of the references desired to be considered must be accompanied with the appropriate fees and/or statements due at the time of the completion of the filing.

Drawings

4. The drawings are objected to because empty diagram boxes are impermissible under 37 CFR §1.83(a) which recites as follows:

"The drawing in a nonprovisional application must show every feature of the invention specified in the claims. However, conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation (e.g., a labeled rectangular box)." (Emphasis added by Examiner)

The empty diagram boxes 106, 108, 110, and 112, found in Figure 3.1 of the drawings, must be labeled with an appropriate descriptive phrase in addition to the reference legend all ready present. Appropriate correction is required.

Replacement drawing sheets including the correction are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

5. The abstract of the disclosure is objected to because the use of legal phraseology such as "said averages" and "said phase shifted averages" is not allowed in the abstract. Correction is required. See MPEP § 608.01(b).

Claim Objections

6. Claims 6-8 and 12-13 are objected to because of the following informalities:
Claim 6 is objected to as there is a typographical error at the end of the claim. The symbol "p" should actually be --p--. Further objections are made for the lack of description for all of the symbols present in the recited equation. Specific reference is made to the symbol "P".

Claim 7 is objected to as not all of the symbols presented in the recited equation are described sufficiently in the claim for one of ordinary skill in the art to determine their exact meaning. Specific reference is made to symbols p, P, α_p , N_s , N_p , and $v_{s,p}(\theta)$.

Claim 8 is objected to as there is a typographical error in the claim. Specific reference is made to the phrase "p is planet p". It appears the phrase should read --p is the number of the planet being solved for-- or an equivalent phrase to more clearly define what "p" in the equation is.

Claim 11 is objected to as not all of the symbols presented in the recited equation are described sufficiently in the claim for one of ordinary skill in the art to determine their exact meaning and the derivation of the equation from one form to another is confusing. It appears Applicant merely cut and pasted the derivation of the equation from the specification into the claim. This can lead to confusion as to which equation should

actually be utilized to perform the claimed function. As to the symbols not defined by the claim, specific reference is made to ω , p, P, N_s , N_p , and α .

Claim 12 is objected to as not all of the symbols presented in the recited equation are described sufficiently in the claim for one of ordinary skill in the art to determine their exact meaning. Specific reference is made to symbols p, P, $\dot{v}_{s,k}$, W_0 , A_0 , W_1 , A_1 , and k.

Claim 13 is objected to as not all of the symbols presented in the recited equation are described sufficiently in the claim for one of ordinary skill in the art to determine their exact meaning and the derivation of the equation from one form to another is confusing. It appears Applicant merely cut and pasted the derivation of the equation from the specification into the claim. This can lead to confusion as to which equation should actually be utilized to perform the claimed function. As to the symbols not defined by the claim, specific reference is made to \dot{v}_s , p, P, k, W_0 , A_0 , i, W_i , and A_i .

Appropriate correction is required.

Allowable Subject Matter

7. Claims 1-5 and 9-10 are allowed.
8. Claims 6-8 and 11-13 would be allowable if rewritten to overcome the objection(s) set forth in this Office action.
9. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach and/or suggest a method of detecting a sun gear fault in an epicyclic gear train including phase shifting computed separated averages of detected sun gear vibrations transmitted through each planet gear and re-combining the phase shifted averages to produce a modified average value of the sun gear vibration.

The closest prior art is that of **Forrester (US 6,298,725 B1)** and **Sabini et al. (US 6,681,634 B2)**. **Forrester** teaches measuring an overall vibration signal of the epicyclic gear train and timewise dividing the overall vibration signal into contributions from each planet gear in order to determine a defect in one of the planet gears. **Sabini et al.**

teaches synchronizing the averaging of an enveloped accelerometer signal to the running speed of the rotating bearing (or machine element) under test. There is no teaching of phase-shifting averaged signals in order to re-combine the signals to produce a modified average value of a sun gear vibration. The modified average value enhances signals representing defects present in the sun gear and making defects within the sun gear spotted more easily.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Enohara et al. (JP 56168518 A), Enohara et al. (JP 56168519 A), Enohara et al. (JP 56168520 A), Enohara et al. (JP 56168521 A), and Enohara et al. (JP 56168522 A) disclose determining damage in a sun gear of an epicyclic gear train by measuring a vibration signal and correlating the vibration signal to the revolution frequency of the sun gear.

Mol et al. (US 5,698,788) discloses a method for analyzing regularly recurring mechanical vibrations.

11. This application is in condition for allowance except for the following formal matters:

Objections to the abstract, drawings, and the claims.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

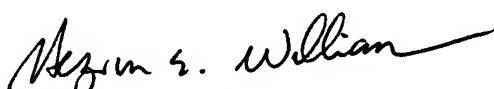
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rose M Miller whose telephone number is 571-272-2199. The examiner can normally be reached on Monday - Thursday, 7:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



RMM
24 September 2004



Hezron S. Williams
HEZRON WILLIAMS
SUPERVISORY PATENT EXAMINER
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